T10D08 – 10.5-6 IB Practice MS

1. B
2. D
3. C
4. A
5. B

6. $(CH_3)_3CI \rightarrow (CH_3)_3C^+ + I^-$;

$(CH_3)C^+ + OH^- \rightarrow (CH_3)_3COH$; 2

Do not allow S_N 2 reaction.

[2]

7. (a) replacement of atom/group (in a molecule)/*OWTTE*;
Do not accept substitution.
by a species with a lone pair of electrons/species attracted to an electron-deficient carbon atom; 2

(b) correct structure of $(CH_3)_3CBr$;
curly arrow showing C-Br bond fission;
correct structure of $(CH_3)_3C^+$;
curly arrow showing attack by OH^- on correct C atom;
correct structure of $(CH_3)_3COH$; 4
*Award **[1]** each for any four.*

(c) correct structure of $CH_3CH_2CH_2CH_2Br$;
curly arrow showing C-Br bond fission;
correct structure of transition state showing charge and all bonds;
curly arrow showing attack by OH^- on correct C atom;
correct structure of $CH_3CH_2CH_2CH_2OH$; 4
*Award **[1]** each for any four.*

(d) *secondary*
$CH_3CHBrCH_2CH_3$;
2-bromobutane;
other primary
$(CH_3)_2CHCH_2Br$;
1-bromo-2-methylpropane; 4

[14]

8. (a) $(CH_3)_2CHBr$/more detailed formula;
secondary/2nd because two alkyl groups attached to C with Br; 2

(b) nucleophilic substitution;
bimolecular/molecularity of two/two species in rate-determining step;
Accept second order.
rate = k $[(CH_3)_2CHBr][OH^-]$; 3
No penalty for incorrect halogenoalkane formula.

(c) $(CH_3)_2CH^+$/more detailed formula; 1

[6]

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